Appendix F. Aviation system analysis

for

Naknek Crossing Intermodal Economic Impact and Airport Use Study

December 2004

An approved component of the Alaska Statewide Transportation Plan
4/25/2005

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1.0 Summary

The Alaska Department of Transportation and Public Facilities (ADOT&PF) Southwest Alaska Transportation Plan stresses the importance of recognizing the relationships between regional transportation facilities so that the most efficient, economical, and safe facilities can be developed and maintained in the region. This study looks at the effects of building a bridge across the Naknek River on airport facility needs at the King Salmon, Naknek and South Naknek Airports.

Chapters 2 and 3 of this report describe the airports, their aviation activity, and future capital improvements. Chapter 4 discusses airport costs and revenues. Chapter 5 presents airport traffic levels, existing forecasts, and a proposed forecast of aviation activity for each airport.

Chapter 6 presents airport options associated with building and not building a bridge across the Naknek River. Options under Scenario A – Aviation Only Improvements address airport options associated with not building a bridge and Scenario B – Bridge and Aviation Improvements addresses airport options associated with building a bridge. Chapter 7 discusses the operating and capital costs associated with those scenarios/options.

The scenarios and options are listed below.

Scenario A – Aviation Only Improvements

Option A1. Keep all three Airports Open

Option A2. Close Naknek Airport

Scenario B – Bridge and Aviation Improvements

Option B1. Keep all three Airports Open

Option B2. Close Naknek Airport

Option B3. Close South Naknek Airport

Option B4. Close Naknek and South Naknek Airports

Option B5. Bristol Bay Borough Operates Naknek and South Naknek Airports

Option B6. Close Naknek Airport and Borough Operates South Naknek Airport

Operating and capital costs of the above scenarios are also shown in tables in Chapter 7 of this report. The following table shows the considerable amount of annual operating costs and future capital costs associated with continuing to operate all three airports. This study shows how some of these costs might be reduced through closure of airport facilities following construction of a bridge. This information will be used in other studies to complete an overall assessment of costs and benefits of building or not building a bridge.

Table 1: Existing cost data from ADOT&PF and Master Plans

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,964,300	$9,985,000	$9,640,000
Naknek	$29,962	$ 9,683,000	$6,320,000	$4,944,000
South Naknek	$19,806	$ 2,260,000	$1,000,000	$ 650,000

2.0 Regional transportation overview

Naknek, South Naknek, and King Salmon are located in the Bristol Bay Borough, as shown in Figure 1. King Salmon and Naknek are on the north side of the Naknek River, and South Naknek is on the south bank. There is a large Regional airport in King Salmon, and Local airports in Naknek and South Naknek. Other than Noluck Road, a 15.5 mile road connecting King Salmon and Naknek, all transportation in the area is by air, water, or ice road.

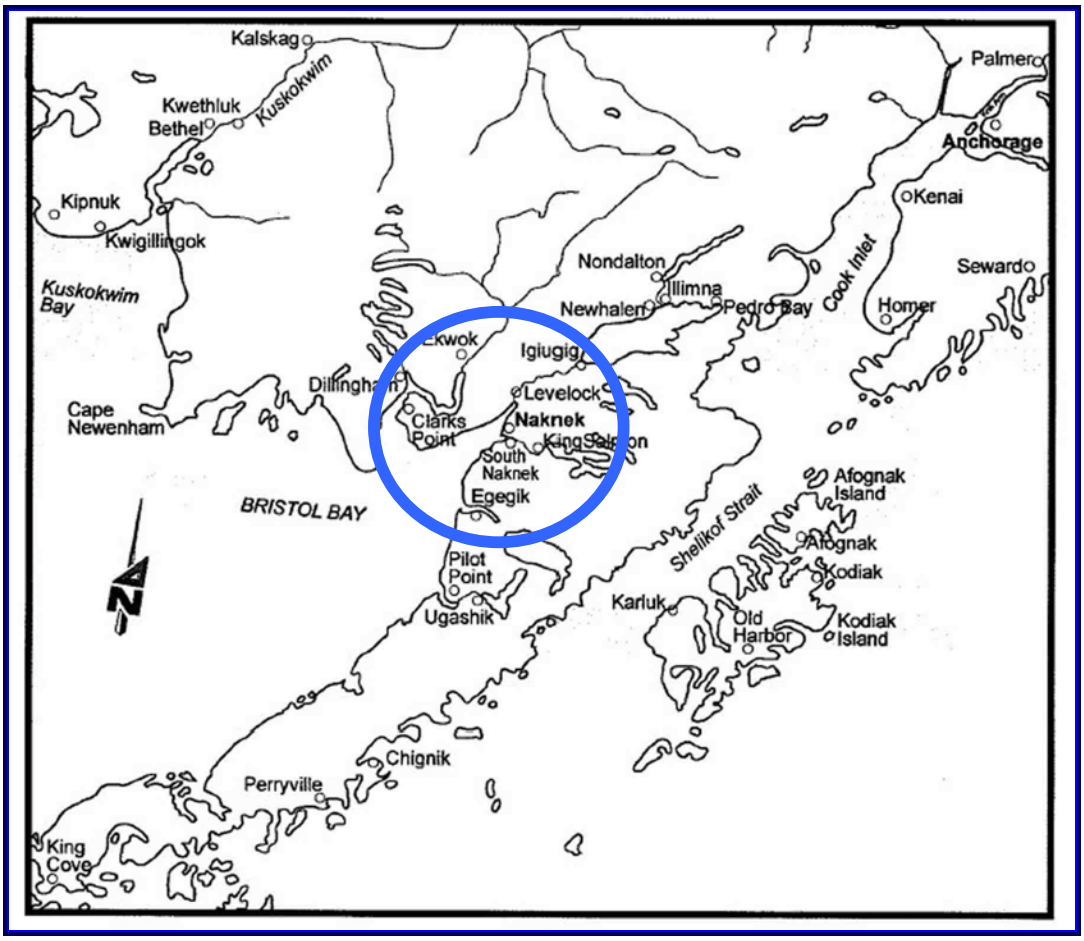


Figure 1: Bristol Bay Area map

Naknek is the economic center of the Borough. Naknek has the regional high school, and has become the hub of the area fish industry. A busy dock, a regional medical center, Borough offices, and service businesses, such as restaurants and grocery stores are centered in Naknek. King Salmon's population has declined since the 1995 closure of the Air Force Base there.

The economy of the Bristol Bay Borough has suffered in recent years with the decline in fisheries, and most fish processors have concentrated their remaining infrastructure to the north (Naknek) side of the River because of the connectivity with road and air service, and subsequent availability of local services. Now there are fewer job opportunities in South Naknek, and most government services are duplicated on both sides of the River, though they are separated only by a mile of water.

Statewide, planning for transportation improvements presents unique challenges because of a decline in State budget revenues and an associated decrease in available *maintenance and operations* funds. At the same time, Federal appropriations for *capital projects* are higher than in the past, for both roads and aviation facilities. The influence of these budgetary trends is to plan to build the most efficient infrastructure that costs less to maintain. In the Bristol Bay Borough, ADOT&PF has identified significant capital improvements for all three airports. Currently, there is a duplication of airport services in King Salmon and Naknek, as they are connected by road. Further, there is a duplication of other public facilities between Naknek and South Naknek, which is necessary because South Naknek is unconnected to the other towns except by air and water.

While many villages in Alaska face the same issues, Naknek Airport has a unique role in education. Because the regional high school and middle school are located in Naknek, South Naknek students in Grades 7-12 have been flown to Naknek Middle and High Schools each day for over 30 years. These flights are conducted in Visual Flight Rules (VFR) conditions. When daylight hours are short, weather is poor and/or the runway lighting at Naknek doesn't work, school days are shortened or cancelled for the students. It also takes several trips to fly the approximately 12 students across. There has been great concern in the community about the students' safety.

Currently the situation is in flux. The State Department of Education changed the formula for pupil transportation funding, so that each student in Alaska is administratively allocated $1,200 annually for this purpose. This funding covers only 20 percent of the cost to maintain the air school bus, so it is possible that this service could end. It further complicates matters that South Naknek no longer has enough students to receive State funding for their elementary school. An upgrade to the Naknek Airport may not help the students if the funding for their air transport is cut.

Historically, an ice road connected Naknek and South Naknek in the winter, but a warming trend in recent years has meant that the river has not frozen reliably enough to support vehicles, nor is it free enough of ice obstacles for boat traffic.

South Naknek retains considerable fish processing infrastructure, an influx of summer commercial fishermen, and a busy 80 x 300-foot dock that has an undeveloped area for future expansion. Recent political discussions about oil and gas lease sales off the southwest coast of Alaska has increased interest in transportation infrastructure in the region, since it could help economic development and subsequently feasibility of the projects.

3.0 Airport facilities and improvements

King Salmon Airport was built in 1941, and was used as a military staging base in World War II. The State of Alaska assumed ownership in 1959, though some military flight operations still occur on the airfield. King Salmon Airport is the most developed in the region. It is a passenger and freight hub for more than 20 villages in the Bristol Bay and Lake and Peninsula Boroughs, and a base for recreational sports fishing guiding and lodging. There is scheduled air service from Anchorage, including jet service. A Master Plan for the Airport was completed in 2001.

A Naknek Airport Master Plan was also completed in 2001. This airport is classified as a Local Airport, but supports about 13,000 operations (operations equal takeoffs plus landings) a year, also in service to outlying communities. About 27 percent of those operations are in daily transport of South Naknek students. This airport is connected by road to King Salmon, but ADOT&PF has identified major upgrades and expansions that will be necessary for the airport to remain operable and up to FAA standards.

A Master Plan has not been conducted for the South Naknek Airport, but it is in relatively good condition and in need of relatively minor surface repairs. It supports about 12,000 operations per year, which are primarily comprised of scheduled air taxi service and the student flights.

Floatplanes operate from Nornak Lake, adjacent to the Naknek Airport and from the Naknek River, adjacent to the King Salmon Airport. Neither airport is owned and operated by ADOT&PF.

Table 2: Summary of King Salmon, Naknek, and South Naknek Airports

Airports		Existing Condition	Improvements Needed
KING SALMON AIRPORT	*road*	Very Good	Parallel taxiway, aprons, resurfacing
NAKNEK AIRPORT	*connected*	Poor	Purchase property, relocate runway, lighting
SOUTH NAKNEK AIRPORT	*unconnected*	Good	Surface Repairs

Source: Master Plans, 5010's, 2003 site visit.

Table 3: Summary of float plane bases

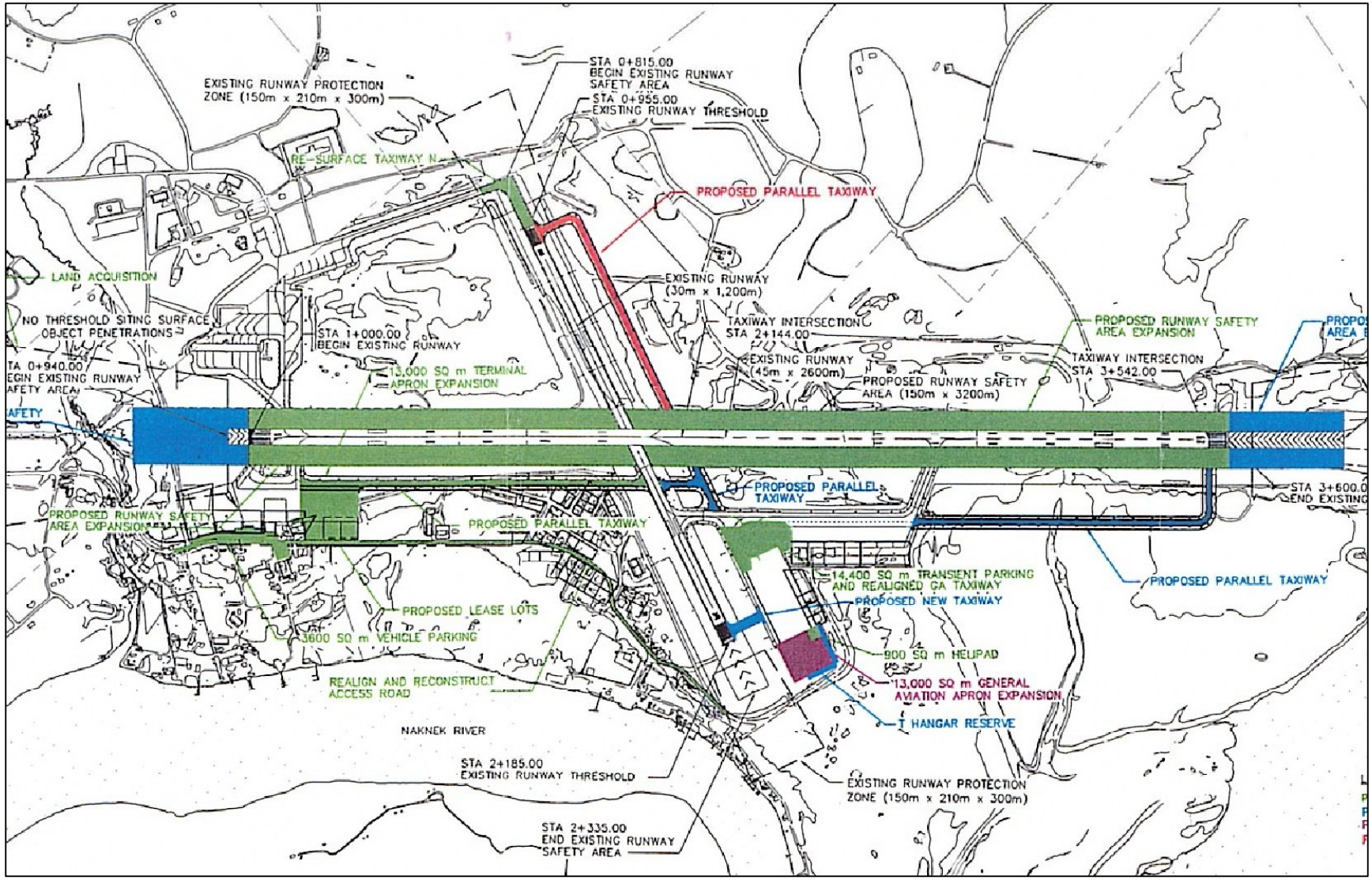
Float Plane Bases	Length	Improvements Needed
NORNAK LAKE *(ADJACENT TO NAKNEK AIRPORT)*	100' x 2,263'	Airspace conflicts with existing Naknek Airport runway; needs extension.
NAKNEK RIVER *(ADJACENT TO KING SALMON AIRPORT)*	500' x 4,000'	Airspace conflicts with existing King Salmon Airport runway, and boaters; needs marked and dedicated waterlane.

Source: Master Plans, 5010's, 2003 site visit.

3.1 King Salmon Airport

An aerial view of King Salmon Airport is shown in Figure 2. A portion of the ADOT&PF Airport Layout Plan, showing the planned upgrades to the Airport is shown in Figure 3.

Figure 2: Aerial view of King Salmon Airport



Source: King Salmon Airport Master Plan 2001

Figure 3: King Salmon Airport development plan

Runways, taxiways, and aprons

King Salmon Airport is situated on 5,277 acres on the north bank of the Naknek River. It includes three landing surfaces, which include primary Runway 11/29 (8,500' x 150') and crosswind Runway 18/36 (4,000' x 100'), both of which have asphalt surfaces in good condition. The third area is a 4,000' x 500' unmarked waterlane on the Naknek River for floatplane use. There are three aprons for commercial and public use. The General Aviation and Terminal aprons, each about 320,000 square feet, are located south of Runway 11/29. The East Apron is used primarily for large freight haul operations, though it allows room for lease lot expansion. The Air Force operates four additional aprons north of Runway 11/29.

Taxiways A and B access the terminal apron from Runway 11/29. Taxiway C accesses the East Apron, and Taxiway D connects C to the General Aviation apron. The military uses three additional taxiways connecting the runways to their aprons north of the runways.

Air traffic control

An FAA control tower is located southwest of the runway intersection. Contract air traffic controllers direct traffic not only at King Salmon Airport, but issue advisories for operations on the Naknek River, Naknek Airport, and South Naknek Airport. In addition, they direct any military operations in the area. They provide separation and direction for aircraft as varied as F-15's, to MD-80's, to C-130's to single-engine Cessnas. Airspace becomes congested in the summer months, with about 21 peak operations per hour on the King Salmon Airport runways alone. Since the airport does not have a full parallel taxiway, capacity is sometimes reduced to about 15 operations per hour, as aircraft take time to exit the runway.

Nevertheless, future funding and operation of the control tower is uncertain. FAA funds contract control towers based on the number of operations at an airport, and operations at King Salmon have fallen below the level that provides 100% federal funding. It should be noted that until very recently, only wheeled-aircraft operations on the King Salmon airfield were measured, and did not include nearby floatplane activity. Floatplane activity was not included in the Tower counts, because there is no dedicated and marked waterlane for aircraft, and the area is currently under US Coast Guard guidance as a publicly-navigable

waterway. For FY 2003, the State of Alaska appropriated (via discretionary funds to the Bristol Bay Borough) matching funds of $275,000 to keep the tower open, but that appropriation has not been renewed for FY 2004. The impending tower closure is under ADOT&PF and FAA review.

Navigational aids, marking, and lighting

The following table shows the navigational aids, marking and lighting at the King Salmon Airport.

Table 4: King Salmon Airport navigational aids, lighting, and markings

HIRL R/W 11/29	High Intensity Runway Edge Lighting
ALSF R/W 11/29	Approach Lighting with Centerline Sequenced Flashers
MALSR R/W 18/36	Medium- Intensity Runway Edge Lighting
Beacon	White and green rotating beacon
Markings	R/W 11/29 and 18/36: non-standard precision instrument markings. Outer and middle markers.
ASOS	Automated Weather Information
DF	Directional Finder
ILS - R/W 11	Instrument Landing System
GS	Glide Slope Indicator
LOC/DME	Localizer/Distance Measuring Equipment
LOM	Locator at Outer Marker
MM	Middle Marker
NDB	Non-Directional Radio Beacon
OM	Outer Marker
PAPI	Precision Approach Path Indicator
RCO-RCAG	Remote Communications Outlet, Air/Ground
RVR	Runway Visual Range
VOR	VHF Omnidirectional Range
VOR/DME	VHF Omnidirectional Range/Distance Measuring Equipment
VORTAC	VOR with Tactical Aircraft Control and Navigation

Source: 2001 King Salmon Airport Master Plan

Airport operators

Peninsula Airways (Penair) operates scheduled air service from Anchorage, and to nine villages in the region, which include Chignik, Dillingham, Egegik, Igiugig, Levelok, Perryville, Pilot Point, Port Heiden, and South Naknek. Alaska Airlines provides scheduled jet service from Anchorage to King Salmon, and shares a terminal with Penair. King Flying Service, based in Naknek, also operates a smaller terminal facility in the same area.

Trident Seafoods and Bristol Bay Contractors operate separate terminal facilities off the East Apron, and are used primarily in the summer for the storage, staging, and hauling of seafood. Lynden Air Cargo, King Salmon Ground Service, and Yute Air operate from another terminal off the East Apron. Egli Air Haul Inc. and Lynn Shawback operate businesses on the General Aviation Apron, and the U.S. Fish and Wildlife Service operates a hangar there as well.

Since the 1995 reduction in the Air Force presence at the Airport, many functions of the base were eliminated or relocated. Basic facilities such as roads, utilities, fuel tanks, and a few storage buildings are still actively maintained, as well as a BAK-12 Aircraft Arresting System and Instrument Landing System on Runway 11/29. Other facilities, such as the headquarters and dormitory buildings, are kept heated for visiting personnel. Military flights are conducted weekly, and training exercises are conducted twice annually.

The King Salmon Airport does not have any public floatplane docking facilities; but there are 17 businesses and private individuals who lease lots along the Naknek River to store and maintain aircraft, or provide other services.

Future development

The following table is a summary of airport improvements recommended in the 2001 King Salmon Airport Master Plan. These recommendations were based on a study of future aviation demand at the airport, and the facilities required to meet the demand and provide additional safety measures. The recommendations are shown in three phases of development, and also show preliminary cost estimates:

Table 5: Recommended King Salmon Airport improvements from the 2001 Airport Master Plan

Project	Phase	Cost
(2) New Wind Cones	I	
Designated Helipad - Strip Land	I	
Land Acquisition for RPZ 11/29	I	
Runway Blast Pad for 11/29 - (300' x 150')	I	
Transient Jet Parking Striping	I	
MITL on T/W N (Medium Intensity Taxiway Lighting)	I	
Survey and Remove Obstructions; Update Chart	I	
Construct New 40,000 SF Parking Area at Terminal Area	I	
Regional Float Plane Study	I	
Relocate, Reconstruct Main Street from Terminal to East Apron	I	
Construct New 140,000 SF Apron Adjacent to Terminal Apron	I	
Utilities to GA and East Apron - Water and Sewer (non-FAA/ADOT&PF)	I	
Parallel Taxiway 11/29 to East Apron (50' x 120') with MITL and Markings	I	
Construct Full 500' RSA Width Along R/W 11/29	I	
Pave Existing Long-Term Parking	I	
Subtotal Phase I		**$19,724,311**
Install GPS Precision Approach to R/W 11	II	
Refurbish, Remodel Old Mark Air Terminal Building	II	
Construct T/W (35' x 350') from GA Apron to R/W 18/36	II	
Install New Approach Control Radar	II	
Rebuild Section from TW H to Threshold of R/W 18 (100' x 500')	II	
Resurface T/W A, B, C, D and E	II	
Construct New 50' x 120' Wide Parallel Taxiway to R/W 29 End, with MITL, Markings	II	
Clear and Survey Lease Lots Southwest of GA Apron for T-Hangars. Realign Security Fencing	II	
Construct T-Hangars (non-FAA/ADOT&PF)	II	
Construct 1000' RSA beyond Runway 29 Approach	II	
Subtotal Phase II		**$9,985,000**
Construct New 140,000 SF Apron Space Adjacent to Existing GA Apron	III	
Resurface R/W 18/36 (100' x 4000')	III	
Resurface R/W 11/29 (150' x 8,015')	III	
Full (35' wide) Parallel Taxiway to R/W 18/36	20+	
Subtotal Phase III		**$9,640,000**
Total, All Phases		**$39,349,311**

Many of the Phase I recommendations have been incorporated into the ADOT&PF's Draft FFY 2002-2007 Airport Improvement Plan Spending Plan, in > FFY 2007 time period, with a cost estimate of $13,150,000. The Regional Float Plane Study, shown in the table above, is recommended for funding in FFY 2006 and FFY 2007.

3.2 Naknek Airport

Runways, taxiways, and aprons

The Naknek Airport consists of two gravel runways: Primary Runway 8/26 (2,112' x 50'), and Crosswind Runway 14/32 (1,835' x 46'.) Both runway surfaces are in a soft and rutted condition. Nornak Lake, which provides a 2,264' x 102' landing area for float planes, is not owned or operated by ADOT&PF. It is located adjacent and parallel to Runway 8/28.

The land surrounding the runways is owned primarily by the Paug'vik Corporation, and there are also a few private parcels, and there is no public apron space or any other public facilities. There is a privately-owned 200' x 400' aircraft parking apron to the west of Runway 8/26. In addition, aircraft park along the edges of Runway 14/32 for most of its length, and within the Runway Safety Area (RSA), as shown in the photograph below. A thicket of alder bushes has grown up there, and shelters the aircraft from the wind. The airport access road parallels Runway 8/26, also within the RSA.

Figure 4: Naknek Airport aircraft parking next to runway

Privately-owned Tibbetts Airfield is also nearby, within the approaches to both runways and Nornak Lake. Tibbetts is no longer used by owner Peninsula Airways, and is for sale. Despite the airspace conflicts, the lack of a clear line of sight between the runways and float plane areas, and the parking intrusions into the runway safety area, the airport has an excellent safety record.

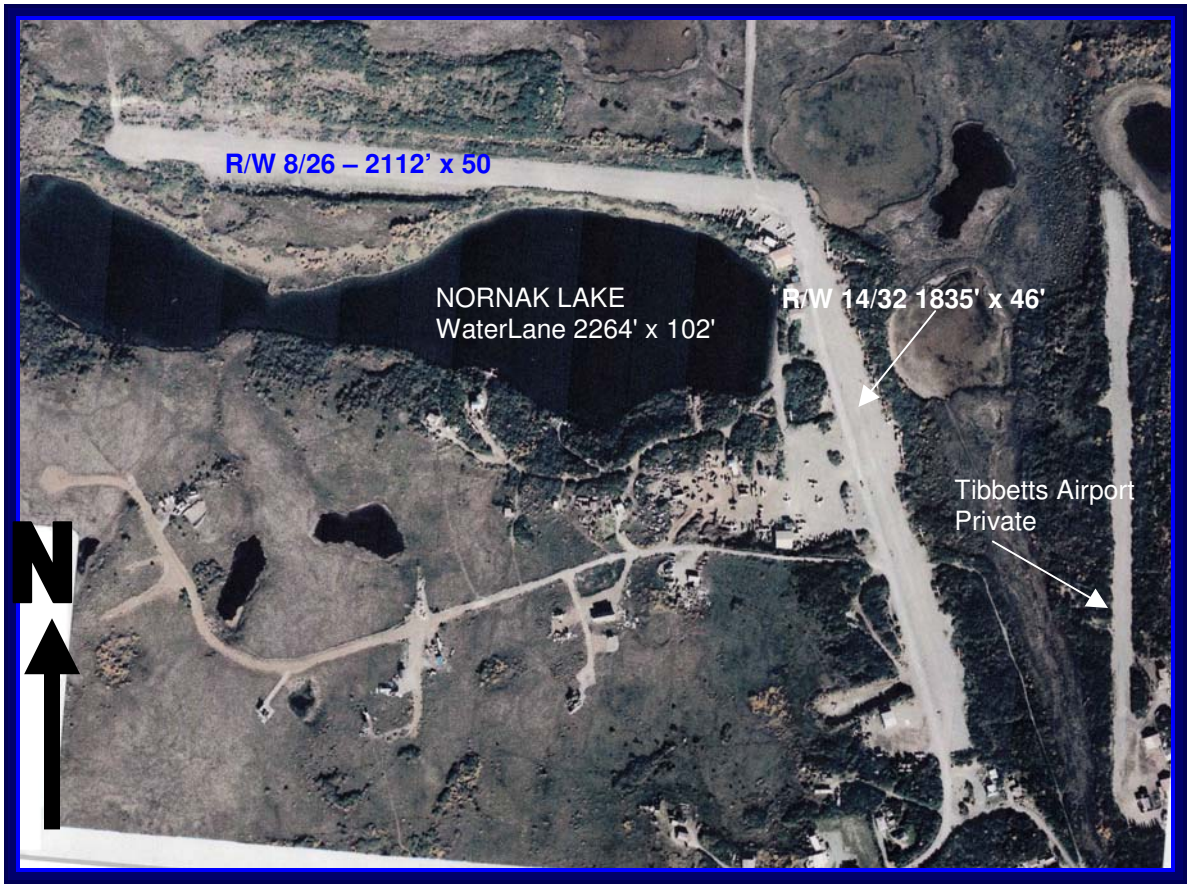


Figure 5: Aerial view of Naknek Airport

The runways are equipped with medium-intensity runway lighting, but it is in poor condition and not always operational. A rotating beacon is located adjacent to Runway 8/26. There are no navigational aids, except for the VORTAC available via the King Salmon Airport.

Airport operators

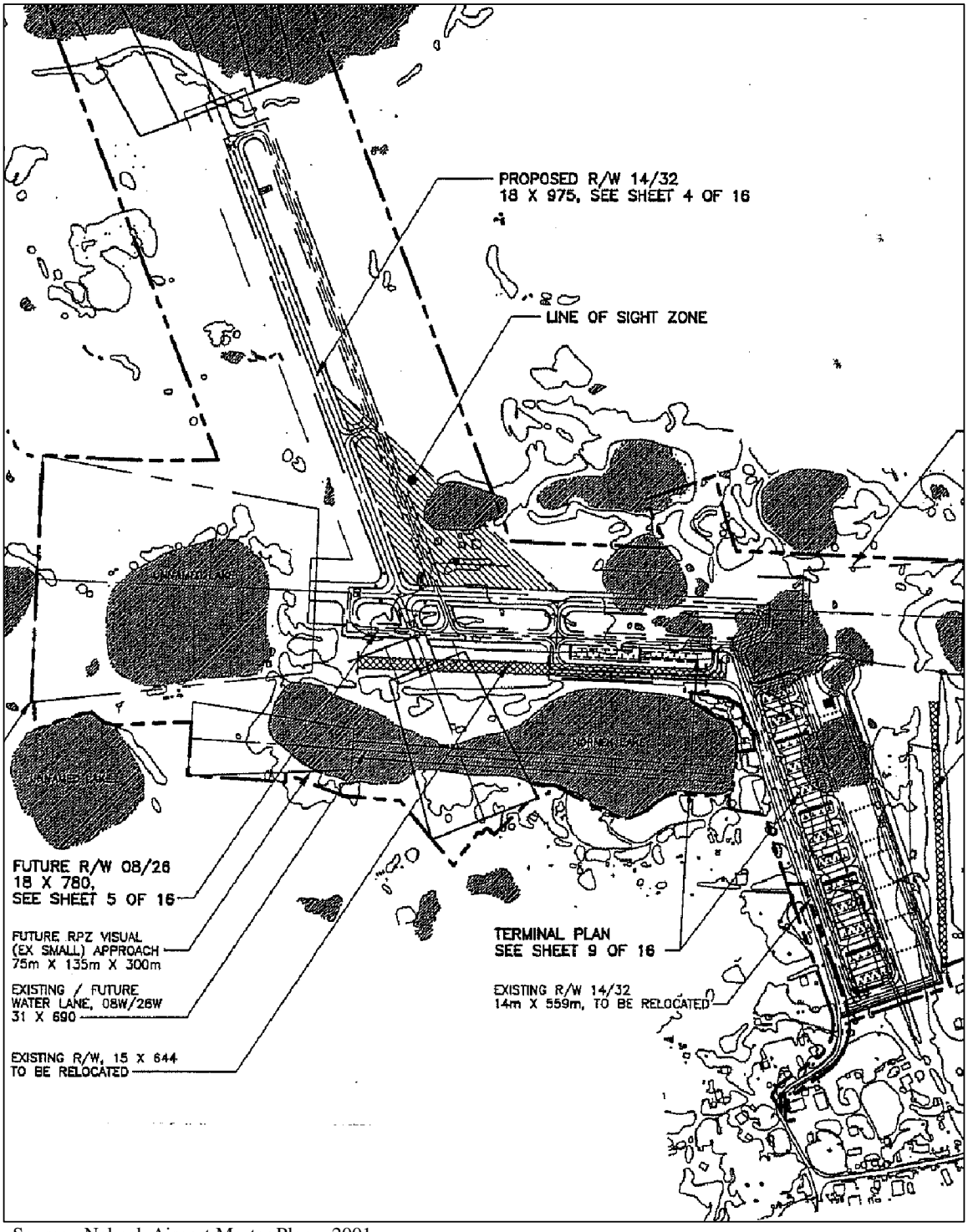
King Air, based at the Naknek Airport, is the contractor who flies the South Naknek children to school in Naknek. Operators based elsewhere, such as Iliamna Air, Yute Air, and Egli Air also use the airport.

Future development

Table 6 and Figure 6 show planned development for Naknek Airport. As stated in the Master Plan, development at Naknek Airport is intended to remedy three primary deficiencies. The first pertains to land status issues, in which ADOT&PF has no right-of-way (ROW) to access the airport or eliminate intrusions into the runway safety areas and imaginary surfaces. In addition there is no ADOT&PF-owned land to develop lease lots or apron areas that meet FAA standards. The second is in regard to airspace conflicts, in which air traffic between the two Naknek runways, Nornak Lake, and nearby Tibbetts Field all overlap with no clear line of sight. The third is in regard to the repair of the facilities, which includes runway surfaces and lighting in poor condition. Under the plan, the Nornak Lake waterlane will remain, though it is about 240 feet shorter than FAA standards. The following Table shows the recommended costs and phasing of the improvements, as shown in the Master Plan.

Table 6: Recommended Naknek Airport improvements from the 2001 Master Plan

Project	Phase	Cost
Acquire Airport Property	I	
Acquire ROW for Public Access	I	
Construct Primary Runway Relocation with MIRL	I	
Remove Terrain Obstructions between Primary and Crosswind R/W	I	
Construct Taxiway, Aircraft Parking, and Aviation Support Areas	I	
Recondition West Access Road	I	
Construct East Access Road	I	
Construct Snow Removal Equipment Building and Acquire Loader with Appurtenances	I	
Phase I Cost		**$9,263,000**
Relocate Crosswind Runway with MIRL	II	
Construct Parallel Taxiway (Adjacent to Crosswind Runway)	II	
Construct Partial Parallel Taxiway (Adjacent to Primary Runway)	II	
Expand Apron Area	II	
Extend Access Road to New Apron Area and Construct Vehicle Parking	II	
Phase II Cost		**$6,320,000**
Construct Taxiway, Aircraft Parking, and Aviation Support Areas	III	
Extend Parallel Taxiway	III	
Resurface Operational Areas as Required	III	
Phase III Costs		**$4,944,000**
Total Costs		**$23,538,000**



Source: Naknek Airport Master Plan – 2001

Figure 6: Naknek Airport development plan

3.3 South Naknek Airport

Facilities

South Naknek Airport's Runway 12/30 is 3,314' x 59', and Runway 4/22 is 2,260' x 59'. Both have a gravel surface. The sandy gravel surface is in fair condition. An aerial view of South Naknek Airport is shown in Figure 7.

Figure 7: South Naknek Airport aerial view

Some of the surface gravel has been pushed to the sides and appears to have contributed to erosion and soft spots on the runways, particularly on the edges near culverts. Runway 12/30 has a significant dip on the southeastern end, as shown below. Runways 12 and 30 have 4-box Visual Approach Slope Indicators (VASIs), and High Intensity Runway Edge Lighting. There is an approximately 200' x 200' apron area to the north of the intersection of the two runways. Two 50' taxiways connect the apron to each runway. This area contains two lease lots, but neither is leased. Airport Street connects the apron to the community road system, passing through the Runway 12 approach area.

Figure 8: South Naknek runway

Future development

ADOT&PF has identified a project to resurface both runways, the taxiways, and apron as a project under the Airport Improvement Plan. It is currently planned for beyond the FY '07 period, and has an estimated cost of $2.2 million. Other improvements shown on the Airport Layout Plan include a road extension around the east side of Runway 4-22 and upgrading the airport to B-II standards. The road extension would eliminate runway incursions from vehicles using the runway to access lands east of the airport.

4.0 Costs and revenues

Naknek Airport maintenance is conducted by ADOT&PF personnel as part of King Salmon Airport and Noluck Road Maintenance. King Salmon Airport receives revenues of approximately $300,000 from the USAF for maintenance, and approximately $120,000 more from leases and fuel charges. For these reasons, the costs and revenues shown in the following table relative to these two airports can only be estimated.

In FY 2003, King Salmon Airport operated at an approximate $320,000 loss, and received the necessary funding from the State's general fund. Losses from 1996-2000 ranged from $220,000 to $2,024,045, but that does not indicate a trend, as reporting sometimes included or excluded capital expenditures by either ADOT&PF or the USAF, and some years required more snow removal and other basic maintenance than others.

South Naknek is maintained separately under private contract. There are no revenues at Naknek or South Naknek Airport.

Table 7: FY 2003 airport maintenance costs and revenues

	Personnel	Travel	Contracts Equipment	Utilities	Supplies	Total
Costs						
King Salmon Airport	$414,968	$9,503	$188,192	$15,632	$106,793	**$737,088**
Naknek Airport	$13,877	$131		$771	$2,183	**$16,962**
South Naknek Airport	$23		$12,000	$6,509	$1,274	**$19,806**
Revenues – King Salmon						
Leases, Fees						**$120,000**
Air Force	$266,282	$0	$4,187		$26,455	**$296,924**

Source: Calculations by ADOT&PF Southwest District Superintendent

ADOT&PF calculates maintenance costs on Airports by lane miles. The following table shows the cost per lane mile at the three airports in 2003. King Salmon Airport is maintained to a more critical standard than other airports in the area, because of USAF runway requirements for their aircraft. Naknek Airport, because Noluck Road connects it to shared King Salmon Airport personnel and equipment, shows a lower apparent cost than South Naknek, which stands alone.

Table 8: Maintenance costs per lane mile

	Cost	Lane Miles	Cost Per Lane Mile
King Salmon Airport (paved)	$737,088	45.6	$16,164.21
Naknek Airport (unpaved)	$16,962	6.2	$2,735.80
South Naknek Airport (unpaved)	$19,806	3.1	$6,389.03

Source: Calculations by ADOT&PF Southwest District Superintendent. Average Cost per lane mile (5,280 'x 12') in the Central Region: $7,784

5.0 Airport traffic forecast

There is great variation in estimates of air traffic and characteristics at King Salmon, Naknek, and South Naknek Airports, and for float plane operations on Nornak Lake and the Naknek River. This is because of the following:

- Forecasts from the Master Plans are higher than actual activity levels because the region's economy and population has declined more rapidly and dramatically than anticipated.

- Beyond the King Salmon Air Traffic Control Tower and certificated air carrier reporting, no recorded data exists.

In this section, the baseline and forecasted air traffic from the 2001 Master Plans, FAA Terminal Area Forecasts, FAA 5010 forms, factors from models generated in the Yukon-Kuskokwim Area Transportation Plan, the Southwest Alaska Transportation Plan, and estimates by area residents and operators are all considered. Conversations with local airport operators have provided the basis for describing types of air travel.

5.1 King Salmon Airport traffic

The following table shows the 2001 Airport Master Plan base year and forecasts through 2019. A median between base year 1996 and 2004 is also shown, as a basis for comparison with Tower Counts for 2001.

Table 9: 2001 King Salmon Airport Master Plan forecasts

	1996	2001	2004	2009	2019
Aircraft Operations	33,284	34,942	36,600	39,316	44,745
Enplaned Passengers	51,707	55,556	59,404	68,694	87,278
Total Based Aircraft	40	40	40	40	42
Air Cargo/Mail (tons)					
Enplaned Freight (tons)	3,500	3,500	3,500	3,500	3,500
Enplaned Mail (tons)	400	500	600	600	1,100

Note: 2001 estimate is the 1996-2004 median.

The FAA's Terminal Area Forecasts are currently updated with historical data provided by the Control Tower through 2001. This operation figure shows 25,926 operations, 9,016 less than the Master Plan estimated for 2001. However, the Master Plan estimates were partly tied to an annual population growth rate of about 2 percent, which is significantly higher than the actual rate of population growth in the Borough.

5.2 Naknek Airport traffic

The forecasts prepared for the 2001 Naknek Airport Master Plan are shown in the following table. There was a wide range of differing estimates for 1996 traffic, from 53,500 operations per year listed in the 1990 FAA Airport Master Record, to the FAA Terminal Area Forecast estimate of 29,000. Local operators estimated 27,000. Responses from a local and non-local pilot survey were also reviewed, and appeared to support the Master Record estimate. Enplaned freight and passengers were not forecast. Air carrier records showed 2,310 commuter passenger enplanements in 1996, which probably did not include about 3,500 student-charter enplanements per year. These results from the 2001 Airport Master Plan are shown below, with an average peak day added to help visualize the activity at Naknek Airport:

Table 10: 2001 Naknek Airport Master Plan forecasts

	1997	2002	2007	2017
Forecasted Operations	53,500	57,464	61,723	71,210
Average Day Peak Month (based on King Salmon proportions)	610	655	704	811
Passenger Enplanements (1996)	5,810			

The 1997 Airport Master Plan base year estimate was derived primarily from the 1990 Airport Master Record. The Naknek Airport Forecasts are revised in this Aviation System Analysis because a variety of factors have changed dramatically since the 1990 Airport Master Record was produced.

These changes include:

- Penair stopped scheduled service to Naknek in 1999, which represented about 10,000 flights. Most of these operations were conducted at adjacent Tibbetts Airfield. However, because Penair uses the descriptive identifier "NNK" (for North Naknek) in their carrier reports, older historical reports of their activity may have been included in "5NK", Naknek Airport.

- Fish-spotting from the air became illegal in 1997, which may account for the historically large number of operations, and relatively low passenger enplanements. These could easily have represented 40 operations a day through the summer months.

- Many of the canneries/fisheries have closed in recent years. Operations on behalf of the canneries once represented about 50 operations a day in the summer. This activity involved the acquisition of goods and services available in Naknek, or transporting workers.

Furthermore, data provided by Penair and King Air indicated current enplanements and operations were significantly less than those forecasted in the Master Plan. Using these lower estimates provides a lower, more conservative estimate of the benefits of building a bridge. Naknek Airport provides secondary air service to the community of Naknek, since Naknek is connected by road to the larger King Salmon Airport. However, it does provide

essential service to South Naknek, both in the transport of schoolchildren, and to South Naknek families traveling to Naknek for goods and services. There are also flights from other towns in nearby Boroughs, such as Egegik, which are primarily trips for supplies available in Naknek, especially for private fish camps.

In addition, the airport provides convenient fueling and maintenance facilities for itinerant aircraft. It also provides wind protection for small aircraft based there, and for exposed aircraft at other airports when a storm is approaching. It is also convenient to load goods directly onto an aircraft from a road vehicle.

An estimate of current air traffic activity from various sources is shown in the following table.

Table 11: Comparison of estimates of current Naknek air traffic

	King Air	Penair	Y-K Plan	FAA 5010	FAA TAF
Total Airport Operations	13,000	10,000		7,700	29,000
Air Taxi	100	1,000		600	12,000
GA Local	10,000	8,000		7,000	7,000
GA Itinerant	2,900	1,000		100	10,000
*Character of Operations**					
A. School Transportation	3,500				
B. Bristol Bay Borough Business	3,500				
C. Fishing	1,500				
D. Itinerant Fueling/Maintenance/ Wind Protection	3,000				
E. South Naknek Resident Personal Business	1,000				
F. Other	500				
Enplanements					
Passenger***	9,380		10/person/ year		
Mail (tons)	0	0			
Freight (tons)**	10		200#/ person/year		

* derived from 1996 Pilot survey, 2003 community meetings, John King.
** derived from South Naknek's population less calculation of freight enplanement to King Salmon
*** 2,880 pupils + 6,500 (2 enplanements x ½ operations, except A, D.)

The Character of Operations shown in the above table can be broken into categories that relate to the type and main purpose of air travel. The categories can be described as follows:

A. School Transportation: Includes daily air busing of students, and air transportation for teachers, school board members, and administrators. Also includes air transportation for students for Bristol Bay Borough-sponsored extracurricular activities such as sports and field trips.

B. Bristol Bay Borough Business: All air transportation related to the construction, maintenance, and supply of public and private utilities and services.

C. Fishing: All transportation related to the supply of commercial fishing, whether a private or business enterprise. Includes equipment, supplies, and transportation of workers.

D. Itinerant Fueling/Maintenance/Wind Protection: Aircraft owners taking advantage of the ease of access at the airport, and temporarily parking aircraft based elsewhere from storms.

E. South Naknek Resident Personal Business: All air activity generated by South Naknek residents traveling for recreation, supplies, and visiting.

F. Other: Includes all else, for example, scheduled or chartered air taxi service from towns outside the Bristol Bay Borough, such as Iliamna or Dillingham.

The following table compares the Master Plan and DOWL estimate for Naknek Airport, as well as the factors used for allocating types and character of operations:

Table 12: Comparison of Master Plan and DOWL estimate

	Master Plan Estimate (2002)	DOWL Estimate
Total Airport Operations	57,464	13,000
Air Taxi	575	100
GA Local	44,247	10,000
GA Itinerant	12,642	2,900
Based Aircraft	70	70
Character of Operations		
A. School Transportation	3,500	3,500
B. Bristol Bay Borough Business	19,967	3,500
C Fishing	8,634	1,500
D. Itinerant Fueling/ Maintenance/Wind Protection	17,268	3,000
E. South Naknek Resident Personal Business	5,936	1,000
F. Other	2,698	500
Passenger Enplanements	6,241	9380
Enplaned Mail	0	0
Enplaned Freight (tons)	10	10

Figure 9 shows the Character of Operations in a chart.

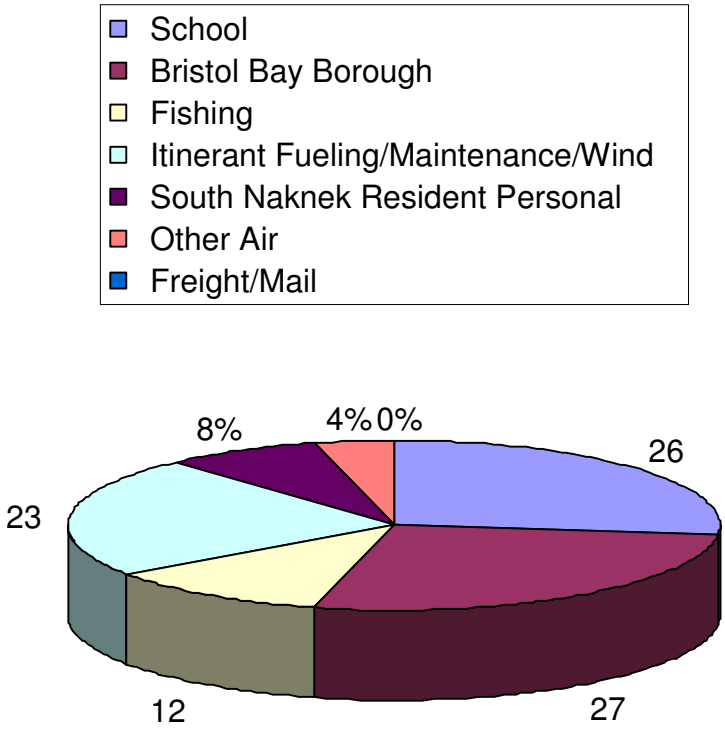


Figure 9: Current Naknek Airport air traffic characteristics

5.3 South Naknek Airport traffic

Though the FAA Terminal Forecasts have not been updated for ten years, estimates of South Naknek operations are supported by air carrier reports filed by Penair. Penair estimates that they represent about 80% of all enplanements at the airport.

Penair operates three scheduled flights a day, for a total of about 2,200 annually, and King Air school-related transportation flights add on another 3,500. There are 10 locally based aircraft that represent about 1,000 flights a year. Various air taxis and private aircraft create about 5,000 operations per year for Borough business, and for South Naknek residents' private business across the River in Naknek. South Naknek Airport is therefore estimated to have 11,700 operations per year, as shown in the following table. Figure 10 shows the Character of Operations in a chart.

Table 13: 2001 South Naknek Airport air traffic characteristics estimates

	Current Estimates*
Total Airport Operations	11,700
Air Taxi	2,200
GA Local	1,000
GA Itinerant	8,500
Based Aircraft	10
Character of Operations	
A. School Transport	3,500
B. Bristol Bay Borough Business	2,500
C. Fishing	1,000
D. Itinerant Fueling/Maintenance/Wind Protection	0
E. South Naknek Resident Personal Business	2,500
F. Air Taxi/Freight Mail	2,000
G. *Other*	200
Enplanements	
Passenger**	8,200
Mail	1
Freight (tons)	2.23

* derived from 2003 community meetings, King Air, Penair

** 2880 pupils + 6500 (2 enplanements x ½ operations, except A,D)

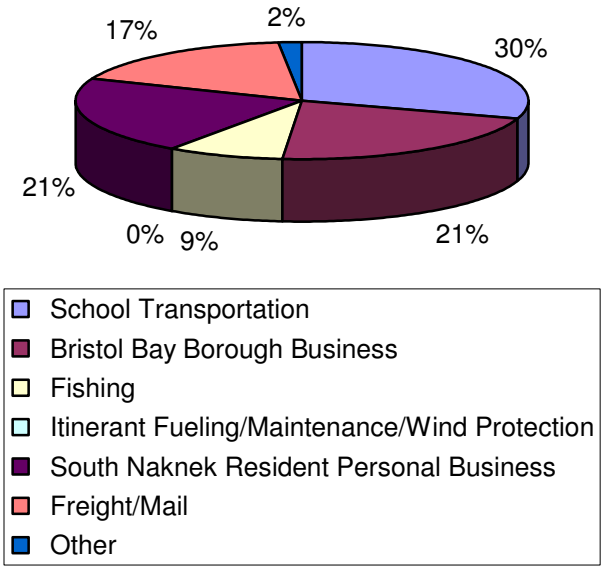


Figure 10: South Naknek Airport character of operations - current

5.4 Floatplane bases

The Floatplane operating areas on the Naknek River adjacent to the King Salmon Airport, and on Nornak Lake adjacent to the Naknek Airport also play a part in the Bristol Bay Borough's aviation system. Operations at Nornak Lake are estimated at 500 per year. Though there is one floatplane based there, the lake is primarily temporarily used for aircraft maintenance for Naknek River operators. Occasionally operators also shelter their aircraft there if extremely windy conditions are anticipated. The Lake is depressed and surrounded by thick bushes.

Naknek River float operations have never been counted, though this is now underway as part of the Air Traffic Control Tower contract process. Preliminary estimates are about 10,000 operations per year. These operations are primarily tourist-related, as access to fishing and hunting areas and lodges. Though not of interest as essential air service, tourism is forecast in several studies to increase in the area, which may be a benefit to the Borough's economy in the future. Floatplane traffic is not expected to be affected by any scenario in this study.

5.5 Forecast summary

The following tables summarize the Base Year (2001) and forecast years (2010, 2019, 2029) air traffic activity levels for the King Salmon, Naknek and South Naknek Airports. Base case population forecasts developed by Northern Economics were used to forecast future activity levels for Naknek and South Naknek. TAF forecasts were used for King Salmon.

Table 14: 2001 base year airport traffic characteristics

	King Salmon Airport	Naknek Airport	South Naknek Airport
Aircraft Operations	25,707	13,000	11,700
Air Carrier	1,315	-	2,200
Commuter/Air Taxi	19,045	100	1,000
General Aviation Local	802	10,000	8,500
General Aviation Itinerant	3,290	2,900	
Peak Month Operations (PMO) (14% of annual)	3,599	1,820	1,638
Average Day Peak Month (ADPM) (2% of PMO)	72	36	33
Character of Operations			
School Transportation	-	3,500	3,500
Bristol Bay Borough Business	-	3,500	2,500
Fishing	-	1,500	1,000
Itinerant Fueling/Maintenance/Wind Protection	-	3,000	-
South Naknek Resident Personal Business	-	1,000	2,500
Other Air Taxi	-	500	200
Freight/Mail	-	-	2,000
Enplaned Passengers	38,460	9,380	8,200
Peak Month (38% annual)	14,615	3,564	3,116
Average Day Peak Month (3% of PM)	438	107	93
Total Based Aircraft	40	70	10
Air Cargo/Mail (tons)			
Enplaned Freight (tons)	3,500	10	2
Enplaned Mail (tons)	500	-	1

Table 15: Forecast summary

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	31,564	15,366	9,435
2029	34,761	16,718	7,737
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	57,002	11,094	6,612
2029	66,171	12,070	5,422

6.0 Scenario development

In developing aviation system scenarios for the Region, some factors are important to consider:

- A dwindling State budget, in which the availability of maintenance funds is expected to decline.
- State policy is being developed which would seek to eliminate duplication of services and facilities, especially in road-connected communities.
- State policy for infrastructure development could be modified with changes in State Administration (over 20 years.)
- Difficulty in applying costs, benefits, and responsibility to other State agencies, which influence and are influenced by transportation projects (i.e. Department of Education.)
- Budget shortfalls throughout the State realistically limit alternative sponsors for airports or any other facilities. However, the Bristol Bay Borough asked for ADOT&PF information about assuming sponsorship of the Naknek Airport.

- FAA's commitment for funding safety improvements, requires also that the sponsor maintain the facility for at least 20 years after the latest grant, under their "Grants Assurances" policy. The State is obligated to maintain South Naknek Airport through 2016, and King Salmon Airport, indefinitely. There is no obligation for Naknek Airport, since no federal funds have been spent there yet.

- If an airport is closed, the unamortized portion of the FAA grant may have to be paid back to the FAA. In some cases, the FAA has considered using these funds to improve other airports in the airport system. Environmental reclamation, if necessary, may also have to be undertaken if the airport is closed or is there is a change in sponsorship.

- All Airports must be safe for public operations.

- Transportation changes unrelated to the proposed bridge may also influence future traffic patterns and capacity. Of note is the King Salmon Control Tower closure, and State pupil transportation policy.

- Possibility of statewide incentives for revenue-generating improvements such as tie-down rentals and other user fees, statewide.

- Possibility that USAF could change M&O funding in support of King Salmon Airport.

- Possibility of improved Float Plane Base Facilities.

In this section, scenarios are developed that describe changes to the Borough's aviation system if a bridge is built across the Naknek River. The scenarios illustrate closures of some airports, and the resulting airport capital and operating cost savings.

Closure of an airport could also mean that another entity assumes sponsorship, control, and the cost of the airport improvements and maintenance, and the airport remains open for public service.

In all scenarios, King Salmon Airport is kept open, maintained, and expanded according to plans already in place.

Scenario A. Aviation Only Improvements

Option A1. Keep all three airports open

Option A2. Close Naknek Airport

Scenario B Bridge and Aviation Improvements

Option B1. Keep all three airports open

Option B2. Close Naknek Airport

Option B3. Close South Naknek Airport

Option B4. Close Naknek and South Naknek Airports

Option B5. Bristol Bay Borough operates Naknek and South Naknek Airports

Option B6. Close Naknek Airport and Borough operates South Naknek Airport

Aviation considerations assumed in each scenario/option are shown in the following table.

Table 16: Aviation considerations in scenario development

	King Salmon Airport	Naknek Airport	South Naknek Airport
Safety/Risk		Requires extensive development to meet minimum FAA and State safety standards.	
Improvement Costs	Requires capital improvements; increased maintenance.	Requires capital improvements; increased maintenance.	Requires capital improvements.
Convenience	15.5 mile road distance to Naknek, approximately 18-mile distance to South Naknek if bridge is built.	Located in the Borough's Population Center; unconstrained access to aircraft.	South Naknek relies on the airport for essential service; if it were closed, and a bridge were built, it could be an 18-mile trip to King Salmon Airport.
School Access	Airport is too far away from South Naknek to accommodate a fly/bus combination to school in Naknek.	Transportation of school children by air to Naknek is expensive and restricts school activities; with a bridge they could be bused.	Relies on airport for transportation of school children; with a bridge they could be bused.
Shift in Air Transportation Demand		Induced relocation of residents and businesses to King Salmon and South Naknek if the airport is closed and/or the bridge is built.	With a bridge, the community thinks that more residents would relocate to South Naknek, and business would be developed there.
Grant Assurances		Improvements to the Airport will trigger 20-year grant assurances to FAA.	The Airport already has grant assurances to the FAA through 2016; if the airport were closed, this may have to be paid back.
King Salmon Control Tower	A shift of more operations to that Airport would bolster sagging operations there, and may trigger FAA/State funding of the Tower.		
Timing		Naknek Airport will need to remain open and may need be improved *before* the time a bridge is built if the school children continue to be flown over from South Naknek.	

6.1 Scenarios-aviation forecasts

The following tables show forecasts of aviation activity for each of the scenarios/options described in section 6.0. The first two tables are for "A" aviation options associated with not building a bridge and the last six tables are for "B" aviation options associated with building a bridge.

Table 17: Option A1 – Keep all three airports open

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	31,564	15,366	9,435
2029	34,761	16,718	7,737
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	57,002	11,094	6,612
2029	66,171	12,070	5,422

Table 18: Option A2 – Close Naknek Airport

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	45,086	0	11,279
2029	49,473	0	9,743
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	66,796	0	7,943
2029	76,841	0	6,870

Table 19: Option B1 – Keep all three airports open

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	31,564	6,289	2,730
2029	34,761	7,006	1,949
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	57,002	4,528	1,966
2029	66,171	5,044	1,403

Table 20: Option B2 – Close Naknek Airport

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	34,709	0	5,875
2029	38,264	0	5,452
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	52,105	0	4,230
2029	54,627	0	3,925

Table 21: Option B3 – Close South Naknek Airport

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	31,564	9,019	0
2029	34,761	8,955	0
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	57,002	6,494	0
2029	66,171	6,447	0

Table 22: Option B4 – Close Naknek and South Naknek Airports

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	40,583	0	0
2029	43,716	0	0
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	63,495	0	0
2029	72,618	0	0

Table 23: Option B5 – Bristol Bay Borough operates Naknek and South Naknek Airports

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	31,564	6,289	2,730
2029	34,761	7,006	1,949
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	57,002	4,528	1,966
2029	66,171	5,044	1,403

Table 24: Option B6 – Close Naknek and Borough operates South Naknek Airport

	King Salmon	Naknek	South Naknek
Operations			
2001	25,707	13,000	11,700
2010	28,939	14,151	11,039
2019	34,709	0	5,875
2029	38,264	0	5,452
Enplanements			
2001	38,460	9,380	8,200
2010	49,841	10,216	7,736
2019	52,105	0	4,230
2029	54,627	0	3,925

7.0 Operating and capital costs for airport scenarios

The following table shows capital costs obtained from the Airport Master Plans and ALPs from each airport and operating costs obtained from ADOT&PF. Also included in capital costs are costs associated with adding wind protection to general aviation tie down areas at each airport.

Table 25: Existing cost data from ADOT&PF and Master Plans

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,964,300	$9,985,000	$9,640,000
Naknek	$ 29,962	$ 9,683,000	$6,320,000	$4,944,000
South Naknek	$ 19,806	$ 2,260,000	$1,000,000	$ 650,000

Assumptions:

- By year 10 when most improvements are made at the Naknek Airport operating costs increase by $13,000/year to $29,962 due to increased electrical costs ($5,000/year) and maintenance ($4,000) of a new functional lighting system and increased fuel and manpower costs ($4,000) of maintenance and snow removal of runways, taxiways and aprons. Until then operating costs are $16,962.
- Even though the South Naknek ALP indicates it could be upgraded to B-II standards in the long-term future, for planning purposes it is assumed it can continue to be developed to B-1 standards, similar to the planned standards for the Naknek Airport.
- South Naknek CIP costs from the ALP include $2.2 million in 1 – 5 years for resurfacing, a $1 million road extension around Runway 4-22 in 6 – 10 years, and $650,000 for a new grader and lighting upgrades in 11-20 years.
- Includes wind protection costs not in the Master Plans. If wind protection is provided for general aviation aircraft it will be provided for all general aviation aircraft at each airport.

7.1 Scenario A – Aviation only improvements

The operating and capital costs in the following two tables are for two airport scenarios associated with not building the bridge. One scenario continues to operate all three airports and the other closes the Naknek Airport.

Table 26: Option A1: Without bridge – Keep all three airports open

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,964,300	$9,985,000	$9,640,000
Naknek	$ 29,962	$ 9,683,000	$6,320,000	$4,944,000
South Naknek	$ 19,806	$ 2,260,000	$1,000,000	$ 650,000

Table 27: Option A2: Without bridge – Close Naknek Airport

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$21,334,300	$9,985,000	$9,640,000
Naknek	$0	$0	$0	$0
South Naknek	$ 19,806	$ 3,610,000	$1,000,000	$ 650,000

Assumptions:

- Naknek operating costs ($16,962/year) cease to be paid in three to five years when ADOT&PF ceases to operate the airport.
- Additional tie down space is provided at the King Salmon Airport at a cost of $2,800,000. Costs would include wind protection measures such as berms, slatted fences or vegetation, or a combination of these measures, if possible.
- Addition of general aviation tie downs does not have measurable effect on operating costs at King Salmon.

7.2 Scenario B – Bridge and aviation improvements

The following tables show capital and operating costs for airport scenarios associated with constructing the bridge. They range from keeping all airports open to closing airports, to transferring ownership to the Bristol Bay Borough.

Table 28: Option B1: With bridge – Keep all three airports open

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,964,300	$9,985,000	$9,640,000
Naknek	$ 29,962	$ 9,683,000	$6,320,000	$4,944,000
South Naknek	$ 19,806	$ 2,260,000	$1,000,000	$ 650,000

Table 29: Option B2: With bridge – Close Naknek Airport

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$21,334,300	$9,985,000	$9,640,000
Naknek	$0	$0	$0	$0
South Naknek	$ 21,806	$ 3,610,000	$1,000,000	$ 650,000

Assumptions:

- Naknek operating costs ($16,962/year) continue to be paid until the Bridge is open.
- Additional tie down space is provided at the King Salmon and South Naknek Airports at a cost of $1,400,000 for each airport. Costs would include wind protection measures such as berms, slatted fences or vegetation, or a combination of these measures, if possible.
- Additional maintenance and snow removal of general aviation tie downs and access taxiway adds $2,000/year to the South Naknek operating costs when the Bridge is open.
- Addition of general aviation tie downs does not have measurable effect on operating costs at King Salmon.

Table 30: Option B3: With bridge – Close South Naknek Airport

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,724,300	$9,985,000	$9,640,000
Naknek	$ 29,962	$ 9,743,000	$6,320,000	$4,944,000
South Naknek	$0	$0	$0	$0

Assumptions:

- The planned South Naknek Airport Resurfacing project can be eliminated and the existing surface can safely meet needs until the bridge is built.
- South Naknek Airport remains open through 2016 when the FAA grant has been amortized or the FAA and ADOT&PF can work out an arrangement where unamortized grant funding invested in the South Naknek Airport does not need to be paid back or can be applied to the planned investments in the Naknek Airport.
- South Naknek Operating Costs ($19,806/year) continue to be paid until the Bridge is open.

Table 31: Option B4: With bridge – Close Naknek and South Naknek Airports

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$23,004,300	$9,985,000	$9,640,000
Naknek	$0	$0	$0	$0
South Naknek	$0	$0	$0	$0

Assumptions:

- The planned South Naknek Airport Resurfacing project can be eliminated and the existing surface can safely meet needs until the bridge is built.
- Additional tie down space is provided at the King Salmon Airport at a cost of $2,800,000. Costs would include wind protection measures such as berms, slatted fences or vegetation, or a combination of these measures, if possible.
- South Naknek Airport remains open through 2016 when the FAA grant has been amortized or the FAA and ADOT&PF can work out an arrangement where unamortized grant funding invested in the South Naknek Airport does not need to be paid back or can be applied to the planned investments at the King Salmon Airport.
- South Naknek operating costs ($19,806/year) and Naknek operating costs ($16,962/year) continue to be paid until the Bridge is open.
- Addition of general aviation tie downs does not have measurable effect on operating costs at King Salmon.

Table 32: Option B5: With bridge Bristol Bay Borough operates Naknek and South Naknek Airports

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$19,964,300	$9,985,000	$9,640,000
Naknek	$ 29,962	$ 9,683,000	$6,320,000	$4,944,000
South Naknek	$ 19,806	$ 2,260,000	$1,000,000	$ 650,000

Assumptions:

- Bristol Bay Borough operating costs will be comparable to the State of Alaska's current costs. Some costs could be higher while other costs could be lower.

Table 33: Option B6: With bridge close Naknek Airport and Borough operates South Naknek Airport

	Annual Operating Costs	Capital Costs 1 – 5 Years	Capital Costs 6-10 Years	Capital Costs 11-20 Years
King Salmon	$737,088	$21,334,300	$9,985,000	$9,640,000
Naknek	$0	$0	$0	$0
South Naknek	$ 21,806	$ 3,610,000	$1,000,000	$ 650,000

Assumptions:

- Naknek operating costs ($16,962/year) continue to be paid until the Bridge is open.
- Additional tie down space is provided at the King Salmon and South Naknek Airports at a cost of $1,400,000 for each airport. Costs would include wind protection measures such as berms, slatted fences or vegetation, or a combination of these measures, if possible.
- Additional maintenance and snow removal of general aviation tie downs and access taxiway adds $2,000/year to the South Naknek operating costs when the Bridge is open.
- Addition of general aviation tie downs does not have measurable effect on operating costs at King Salmon.
- Bristol Bay Borough operating costs will be comparable to the State of Alaska's current costs. Some costs could be higher while other costs could be lower.